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THE LATE KING

WITH deep sorrow, at the moment of going to press, we receive the news that His Majesty King George VI passed away peacefully in his sleep early on Wednesday, February 6th, 1952. At this moment of universal mourning it falls to us to voice the grief of the veterinary profession of this country, of which His Majesty was the Royal Patron. Coming to the throne under circumstances which all can still vividly recall, he has discharged his duty as Sovereign, in spite of all handicaps, with that simplicity and devotion which have been a model to his subjects during a period of stress and transition. One of his first acts was the opening of the Royal Veterinary College at Camden Town, at which ceremony His Majesty and the Queen endeared themselves by their evident interest in the welfare of that institution and the profession. We, therefore, in this issue, wish to express our heartfelt sympathy with Her Majesty the Queen and all members of the Royal Family in the loss of one who gave unsparingly of his strength and talents in the service of his peoples to whom he was a fine and inspiring example.

THE TOXICITY OF DDT AND BHC FOR DOMESTIC ANIMALS

A REVIEW

BY

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INTRODUCTION

A number of complex chemicals are now being used extensively in agriculture for their insecticidal properties. Compared with arsenic or nicotine, many of these chemicals have a low degree of toxicity to animals ; nevertheless, they are, of necessity, poisons.

Two of these insecticides, DDT and BHC, have been extensively used all over the world for the control of ecto-parasites on domestic animals, and, for the most part, they have been used with complete safety and without ill effect. The object of the present review is to bring together the available information on the toxic hazards of these insecticides for the various species of domestic animals.

The toxicity of any chemical is influenced profoundly by its ability to enter the blood stream, by which medium it is dispersed throughout the body. Any factor which aids absorption obviously increases the toxicity of the chemical. For this reason, the method of application of an insecticide, and its formulation, must be considered in any assessment of toxicity.

METHODS OF APPLICATION

An insecticide may enter the body through the intact skin, or through the broken skin, by absorption through the walls of the intestinal tract, as a result of swallowing, or through the lungs following inhalation or aspiration. Dipping is associated with all channels of absorption, and is therefore, potentially, the most hazardous method of application. In the case of hand dressing or swabbing, the portal of entry is limited to skin absorption ; with spraying, however, in addition to skin absorption, there is a danger of inhalation. The inhalation of particles of insecticide is influenced by their size ; where the particle size is small, and thereby easily disseminated, some inhalation is inevitable. In the case of aerosols and smokes, the danger of a toxic reaction as a result of inhalation can be serious, if too great a concentration of insecticide is allowed to build up in a confined space.

A dusting powder is probably the safest way of applying an insecticide to the skin of an animal. An example of this is afforded by an experiment conducted at this research station, in which rabbits were dusted with 60 grammes of undiluted powdered technical BHC (13 per cent. gamma isomer) and restrained in linen bags, their heads excluded, for 24 hours without ill effect. The oral lethal dose of technical BHC for the rabbit is 3 to 5 grammes.

The type of formulation of an insecticide will also influence its toxicity. Theoretically solutions are considered most toxic, followed by emulsions and wettable powders (Jones, 1946).

THE TOXICITY OF DDT

DDT is a white crystalline solid, with a slight but characteristic odour. The commercial substance contains about 80 per cent. of the para para isomer, which is responsible for the insecticidal activity. DDT is insoluble in water, but soluble in a wide range of organic compounds, including fats. The manifold uses of DDT for the control of ectoparasites of both plants and animals are well known. The purpose of this paper, however, is to review the toxic hazards of DDT, with particular emphasis on the symptoms, prognosis and treatment of DDT poisoning in the various species of domestic animals.

THE METABOLISM OF DDT

When DDT is absorbed into the animal body, it permeates all tissues, concentrating in the fat, where it is stored as chemically unchanged DDT (Woodard *et al.*, 1945). Judah (1949) has shown that following the administration of DDT the blood sugar rises and then falls, the blood potassium and serum lactate rise to high levels, and glycogen is rapidly depleted from the liver. DDT is only very slowly excreted, appearing in the urine as an acetic acid derivative formed by oxidation. A single dose of DDT requires several weeks to be completely eliminated from the animal body. DDT is also excreted in significant amounts in the milk, and has been detected in hens' eggs. According to Finnegan *et al.* (1949), DDT can be transported across the placental barrier to the foetus.

When a toxic amount of DDT has been administered it excites a nervous response, probably due to direct stimulation of the central nervous system. This action is attributed to DDT itself and not to a metabolic transformation product (Philips & Gilman, 1946). The same authors observe that acute DDT intoxication causes death, by CNS excitation followed by depression, and respiratory failure. An alternative cause of death is ventricular fibrillation, which occurs mostly in the dog. Chronic poisoning by DDT causes liver damage.

GENERAL TOXIC HAZARD

As a general rule, man and animals can withstand contact or the administration of substantial amounts of DDT in single doses. The acute toxic dose of DDT for man is estimated to be 38 grammes, or approximately 0·5 gramme per kg. DDT at this dosage rate has been administered orally to horses, cattle, pigs and dogs without ill effect (Ewy, 1947). Anderson and Khorram (1948) have recorded that an Iranian sanitary squad mixed and sprayed DDT in oil daily for over nine months without ill effects, and there are other reports of a similar nature.

The chronic toxicity of DDT, however, requires consideration as its slow rate of excretion allows it to be accumulated readily in the animal body. Experiments with laboratory animals have indicated that the repeated administration of DDT, in sub-toxic amounts, can result in the build-up of sufficient DDT to induce a toxic reaction. Furthermore, the metabolism of fat, as a result of starvation or disease, might cause the release of toxic amounts of DDT. The toxic hazards of DDT, therefore, lie mainly in its cumulative effect due to the continued ingestion of DDT-treated fruit, vegetables, and the food products from treated animals (Cattell *et al.*, 1946).

The reaction of the public health authorities to this discovery was to limit the use of DDT on foodstuff. Nevertheless, the publication of chronic toxicity dangers associated with an insecticide believed to be practically non-toxic developed a prejudice against its use and DDT was used as the scapegoat for obscure complaints and unaccountable deaths.

In an attempt to bring reason out of chaos, the United States Department of Agriculture, and the Federal Security Agency, issued a statement of DDT toxicity, an extract of which is quoted, as published in *Vet. Med.* (1949), **44**, 315. "There is no evidence that the use of DDT, in accordance with the recommendations of the various Federal Agencies, has ever caused human sickness due to DDT itself."

Symptoms of poisoning definitely due to the continuous administration of DDT, other than for experimental reasons, have not been recorded in farm animals, to the writer's knowledge. It has been established that DDT applied to forage can cause detectable amounts of DDT to be excreted in the milk of cows to whom the forage is fed. Biddulph *et al.* (1949) found that DDT applied to alfalfa at the rate of 4 lb. per acre resulted in 36 p.p.m. DDT appearing in the milk of cows receiving 30 to 40 lb. daily of the treated alfalfa. The DDT content of the milk was determined by a colorimetric method. However, although it is possible, experimentally, to induce a toxic reaction by feeding forage contaminated with DDT, the amounts of DDT required are sufficiently substantial to make it an unlikely occurrence under normal farming practice.

DDT does not irritate the intact skin, and experimentally the application of a 5 per cent. DDT soap paste to the scarified skin of a dog did not interfere with normal resolution. When DDT is administered by mouth, in large doses, some irritation of the gastric and intestinal mucosa, indicated by areas of congestion, may be observed in a limited number of cases.

General *Post-mortem* Findings

In the acute toxic reaction no visible pathological changes may be observed. Petechial haemorrhages of the heart have been observed in some animals, and a similar lesion is sometimes observed in the stomach and duodenum following the oral ingestion of excessive quantities of the insecticide. When DDT has been administered over a long period, liver damage consisting of focal areas of necrosis has been described by Cameron (1945). Globus (1949) reported that there was no recognisable morphologic alteration in the brain of monkeys, dogs, cats and rats affected with DDT poisoning.

Pluvinage and Heath (1946), however, have observed a diffuse undifferentiated degeneration of the ganglion cells in the brain of the cat.

All animals appear to suffer from the same general symptoms; however, the toxic hazards associated with the use of DDT vary with each species, and for this reason the chief domestic animals are considered individually.

The Cat

The cat is the most susceptible of all domestic animals to the toxic effects of DDT. Toxic reactions in cats have followed the application of a quart of a 0·5 per cent. suspension (Neve, 1946) and the use of a 10 per cent. DDT dusting powder (Morse, 1947). There appears to be a considerable variation in susceptibility to DDT within the cat species. Pluvinage and Heath (1946) observed that while a single injection of DDT in oil intramuscularly, at a dose of 100 mg. per kg., was lethal to one cat, another cat survived for 232 days after a series of eight injections of 665 mg. per kg. of DDT. This experiment with injections of DDT suggests that toxicity arising from the external application of DDT to cats may not necessarily be associated with the type of coat or licking habits of the animal, but due to a definite susceptibility of the individual animal, or breed of cat.

Symptoms.—Symptoms usually appear four to five hours after the application of the DDT. Neve (1946) observed that the first symptom to appear was an intermittent spasm of the neck muscles, causing the head to shake. Nervous tremors of the legs, back and tail developed later and the cat adopted a gait in which flexion of the limbs was exaggerated. Symptoms were most severe during the first 24 hours, and nervous tremors persisted until the fifth day, although by the third day there was marked improvement. Throughout the period of the toxic reaction the animal was hypersensitive, and the application of a stimulus such as handling, bathing the animal, or even in some cases the presentation of food, induced a reaction manifested by a convulsion or worsening of the nervous tremors.

Treatment.—A reasonable treatment is to narcotise the cat, or if the symptoms are severe and convulsions are occurring, induce anaesthesia. The barbiturates are probably the most appropriate drugs for this purpose, and the nature of the symptoms leaves little alternative but to use an intraperitoneal injection. When the cat has been narcotised, an effort can be made to remove the DDT from its coat. Work by Koster (1947) and others suggests that injections of calcium borogluconate and glucose-saline assist in reducing the severity of the symptoms. If the DDT has been ingested, a non-oily purgative would assist in the removal of the chemical from the intestines. The cat should be kept quiet and milk and oily foods withheld, especially if ingestion of DDT has taken place.

The prognosis in a case of DDT poisoning may be assessed from the severity of the symptoms and the fact that 10 to 18 hours represents the most critical stage. The onset of convulsions is serious. DDT should not be used on the cat in view of its undoubted susceptibility to this insecticide.

The Dog

The dog is much less susceptible to DDT poisoning than the cat. Salisbury (1947) quotes an experiment in which 100 dogs were dipped in a 2 per cent. DDT suspension without ill effect while 18 out of 28 cats died when similarly treated. Ewy (1947) dosed 50 dogs with DDT, at a dosage rate of 0·5 gramme per kg., without inducing toxic symptoms. However, Chou (1946) assesses the acute oral LD 50 of DDT for dogs to be 0·75 gramme per kg. Bing *et al.* (1946) administered DDT in oil at a dosage rate of 100 mg. per kg. daily and were able to initiate a mild nervous tremor. Daily doses of 250 mg. per kg. caused severe nervous symptoms. There is some evidence to suggest that the dog may develop a toxic reaction in practice as a result of repeated contact with DDT.

Symptoms.—Nervous tremors appear four to six hours after the application or administration of the DDT. In mild cases no further toxic reaction will be observed; in more severe poisoning, nervous tremors become intense and involve all muscle groups. The animal's gait is affected, with exaggerated movement, as in the cat. Bing *et al.* (1946) describe an animal as standing with the legs rigid, hyper-extended and abnormally abducted. Tilting the head to the right or left resulted in extreme extension of the right or left leg. On moving, the dog proceeds in a zig-zag fashion. Later the dog becomes prostrate with extensor rigidity, and convulsions occur.

The critical phase appears to be 10 to 18 hours after contact with the insecticide, and nervous tremors and inco-ordination may persist for five days. The dog is hypersensitive to a variable degree, and the application of a stimulus will induce

a temporary worsening of the symptoms. DDT may cause death in the dog by inducing ventricular fibrillation, apart from respiratory failure.

The use of DDT on a flea-infested dog may be followed rapidly by a very violent response due to the irritation caused by the fleas undergoing a phase of intensified activity following contact with the insecticide. Some dogs may become frenzied in their efforts to alleviate this irritation, which is, however, of short duration.

Treatment.—Treatment follows the same general lines as that suggested in the case of the cat. Use barbiturates to induce sedation, for which phenobarbital is recommended by Philips and Gilman (1946) as it controls the nervous symptoms with the minimal depression of the CNS. In addition to glucose-saline, and calcium borogluconate, the subcutaneous injection of 10 to 20 mg. of riboflavin is suggested by Brito-Babapulle (1951).

The danger of ventricular fibrillation makes a guarded prognosis advisable when a severe toxic reaction is occurring, even though convulsions have not appeared. The critical phase of the symptoms is the same as for the cat. A DDT dusting powder for ectoparasite control has been extensively marketed both in this country and the U.S.A., and while it is a matter of opinion as to whether DDT is to be preferred to derris, BHC or other insecticides, the number of reported cases of DDT toxicity in the dog is very small, and mainly confined to puppies.

Cattle

The minimum oral toxic dose of DDT approximates 0·5 gramme per kg. (Kingscote, 1946). Cattle have been sprayed with a 5 per cent. DDT wash (Howell *et al.*, 1947) and repeatedly sprayed at four days' interval with 1·5 per cent. DDT (Bushland *et al.*, 1948) without ill effect. Cattle have been extensively dipped in 0·5 per cent. DDT. Daily oral doses of 100 mg. per kg. can, however, induce a mild toxic reaction (Orr & Mott, 1945).

Symptoms.—The beast goes off its feed and becomes very excitable. Muscular tremors develop, commencing with the neck and spreading over the legs and body. The posture and gait become abnormal, being described by Orr and Mott (1945) as apparently indicative of sore feet, the legs being lifted repeatedly. In more severe cases of poisoning there may be a partial paralysis of the hind quarters. On moving there is evidence of inco-ordination, which may be manifested as lameness. The tremors and inco-ordination may persist for a week.

Treatment.—There appears to be a wide margin between a toxic dose of DDT and the amount required to cause death. Although an oral dose of 0·5 gramme per kg. can induce a toxic reaction, animals have recovered from 1·1 grammes per kg. (Kingscote, 1946). This would suggest that where an animal shows nervous tremors with some inco-ordination as the result of the ingestion of a toxic dose of DDT, recovery is possible, although symptoms may be apparent for several days. A rational line of treatment would be the injection of calcium borogluconate, the use of a saline purgative, such as Epsom-salt, in the event of DDT ingestion, and keeping the animal quiet.

It is difficult to appreciate how a toxic amount of DDT could be ingested by a beast under normal conditions because excessively contaminated forage will not be accepted, and the insecticide is used externally at a strength far below that likely to cause any ill effect.

Sheep

Orr and Mott (1945) failed to induce toxic symptoms in sheep using single oral doses of DDT at 1·5 grammes per kg. They also failed to cause any reaction to the daily administration of DDT in progressive weekly doses of DDT at 100, 150 and 220 mg. per kg. Plummer (1946) was able to spray sheep with 5 per cent. DDT in kerosene base without ill effect, and Bushland *et al.* (1948) repeatedly applied 1·5 per cent. DDT at an interval of four days. 0·5 per cent. DDT is widely used as a sheep dip.

Symptoms.—According to Orr and Mott (1945), who caused toxic symptoms in a sheep following the administration of DDT, 2 grammes per kg., symptoms are delayed in onset and may not appear until 24 hours after the ingestion of the insecticide. Symptoms consisted of nervous tremors, with inco-ordination on the first day of the reaction ; the nervous tremors continued until the third day, during which period the animal refused its food. The sheep was normal on the fourth day.

Treatment.—The chances of DDT poisoning occurring in sheep are remote. Should a toxic reaction occur the same treatment as outlined for the cow presumably would be appropriate.

Goats

Goats are as tolerant to DDT as sheep. Telford and Guthrie (1946) dosed goats by mouth with DDT in amounts of 1·5 to 3·3 grammes per kg., without lethal effects, although toxic symptoms occurred at 1·5 grammes per kg. Goats have been sprayed repeatedly with 1·5 per cent. DDT at intervals of four days without ill effects (Bushland *et al.*, 1948).

Symptoms.—Spicer *et al.* (1947) have described the toxic symptoms of DDT in the goat, which consist of excitability, nervous tremors and inability to stand in severe cases. However, the prostrate goat may continue to struggle and kick. As in the case of the sheep, a toxic reaction may not appear until 12 to 24 hours after administration of the insecticide.

Treatment.—The accidental ingestion of DDT by the goat is possible, and the delay in the onset of the symptoms would correspondingly extend the critical period of the reaction. Treatment would be on lines similar to that recommended for cattle. Furthermore, excitement in the goat might be controlled by the use of sedatives.

Pigs and Horses

According to Konst and Plummer (1946) the pig is the animal most resistant to the toxic effects of DDT. Ewy is reported as having dosed horses and pigs with DDT at the rate of 0·5 gramme per kg. without ill effect. Both species have been sprayed with 5 per cent. DDT without ill effect. Plummer (1946) and Bushland *et al.* (1948) repeatedly sprayed pigs and horses with DDT at 1·5 per cent. every four days. Orr and Mott (1945) failed to induce a toxic reaction in two horses after the daily administration of DDT in progressive weekly doses of 100, 150 and 200 mg. per kg. The writer has not seen detailed reports on the symptoms of DDT intoxication in the horse or pig. It can only be assumed that they would follow the same course as previously described for other animals.

Poultry

The minimal acute toxic dose of DDT given by mouth is above 0·49 gramme per kg. (Telford & Guthrie, 1946). Kingscote and Jarvis (1946) caused the death of young turkeys by dosing them with 750 mg. of DDT in oil.

Chickens and ducks died as a result of being dipped in 2 per cent. DDT suspension (Salisbury, 1947), and turkeys have died after being dipped in a 1 per cent. DDT wash. A 5 per cent. DDT dusting powder was liberally applied to young turkeys without ill effect (Kingscote & Jarvis, 1946.)

Chickens are susceptible to DDT chronic toxicity: the addition of 0·125 per cent. to the feed caused death after 12 weeks, and 0·03 per cent. DDT reduced egg production (Rubin *et al.*, 1947).

Symptoms.—In the case of an acute reaction symptoms appear some hours after dosing; tremors are observed with inco-ordination, and the head may be held twisted to one side. In turkeys, according to Kingscote and Jarvis (1948), there is blinking of the eyelids and evidence of dyspnoea. The bird may crouch in the early stages, but later collapses on to its side. In chronic poisoning Rubin *et al.* (1947) record anorexia and emaciation, culminating in tremors, inco-ordination, collapse and death.

Treatment.—The use of calcium has been reported as being beneficial in the treatment of a DDT toxic reaction in the turkey. Salisbury (1947), already quoted, observed that there was evidence that a calcium deficiency predisposed to a DDT toxic reaction. If DDT is used on poultry it would appear to be a wise precaution to prevent contamination of the litter and run, so as to obviate the chances of its ingestion.

BENZENE HEXACHLORIDE

Introduction

Commercial benzene hexachloride is a waxy solid, varying from light brown to almost white, with a characteristic musty odour. It is a mixture of isomers, five of which are known, and usually contains 12 to 14 per cent. gamma isomer, which is mainly responsible for its insecticidal activity. Benzene hexachloride is insoluble in water, but soluble in a wide range of organic substances, including fats. Preparations containing up to 99 per cent. gamma isomer are available.

General Toxicity

The toxicity of BHC preparations varies according to the proportions of the various isomers present. The four main isomers, alpha, beta, gamma and delta, differ in their acute and chronic toxicity and, furthermore, are antagonistic in their individual effect on the animal body (McNamara, 1947). Work by Slade (1945) on the acute toxicity to rats of the four isomers gives the following assessment of their relative acute toxicities.

Table I

	Percentage in technical BHC	Acute toxicity assessed from acute oral LD 50 to rats
		mg. per kg.
Alpha ...	70	1·7
Beta ...	5	6
Gamma ...	12-14	0·19
Delta ...	11-13	1·25

In this paper the term "BHC" refers to the technical grade benzene hexachloride as defined above, the isomers being present in the proportions shown in Table I.

The writer has no knowledge of any report on the metabolism of BHC after it has been ingested. Dallemagne *et al.* (1948) observed a rise in the potassium level of blood, but no change in blood calcium. The ingestion of substantial quantities of BHC can cause the death of ectoparasites feeding on the blood of the animal (Wilson, 1948). This would suggest that the insecticidal principle of BHC is absorbed and circulating in the peripheral blood stream. There is evidence to show that the gamma isomer is a nervous stimulant for short duration, while the other isomers induce a prolonged nervous depression. This dual action is observed in the case of a BHC toxic reaction.

The four main isomers of BHC are stored in fat from which the gamma and delta isomers are eliminated very much more quickly than the alpha and beta isomers (Davidow *et al.*, 1948). Fitzhugh *et al.* (1949), using rats, noted that all isomers caused some liver damage, and the alpha and gamma isomer also attacked the kidney.

General *Post-mortem* Findings

There may be no macroscopic lesions, apart from petechial haemorrhages of the pericardium, and congestion of the kidney. Where BHC has been ingested by mouth, discrete areas of congestion may be found in the stomach and the first part of the intestines. Microscopic examination may reveal evidence of kidney damage manifested by glomerular and tubular congestion, and in the liver, congestion. It has been recorded by Gerebtzoff *et al* (1950) that in the case of chronic poisoning by the gamma isomer there is a general deposition of fat in most tissues.

Toxic Hazards

Toxicity of BHC is generally considered to be less acute than that of DDT. The slow elimination of the alpha and beta isomers causes the chronic toxicity of the insecticide to approach that of DDT. However, the increasing use of BHC containing a high proportion of gamma isomer substantially lowers its chronic toxicity hazards, although there is a proportional increase in the acute toxicity. BHC is insecticidal at concentrations well below those likely to induce a toxic reaction, and apart from the cat the chances of a toxic reaction, occuring in normal practice are very remote. When a BHC rich in gamma isomer is used, or the pure gamma isomer itself, there is a corresponding decrease in the required insecticidal concentration which partially compensates for the increased acute toxicity. This compensation might be qualified to some slight extent by the lessened antagonistic effect of the other isomers, as recorded by McNamara (1947).

Toxic Symptoms, Treatment and Discussion

Cat

Cats are susceptible to the toxic effects of BHC. Blood *et al.* (1948) describes a toxic reaction in a Persian cat after having been washed in 0·05 per cent. BHC. Four hours after the application muscular twitchings were observed which worsened to opisthotonic convulsions, with the death of the cat within an hour of the appearance of the symptoms. Repeat test washings with short-haired cats resulted in a toxic reaction which commenced five hours after the use of the 0·05 per cent. BHC wash and was manifested by hyper-excitability, amounting to frenzy for 10 minutes. The cat was normal, however, an hour later. A rational treatment in the event of a toxic reaction in the cat would be the induction of deep narcosis or anaesthesia, for which purpose phenobarbital or pentobarbital are recommended by McNamara and Krop (1948). The relatively transient effect of the gamma isomer to which the convulsions may be attributed allows a better hope of success than that which can be expected in the case of a DDT toxic reaction. There is no recorded evidence (to the writer's knowledge) of the value of calcium borogluconate, or glucose saline. In view of the liver damage associated with BHC, however, it would be reasonable to assume the use of glucose saline to be therapeutically sound. When the cat is narcotised some effort should be made to remove the insecticide from the coat in the event of its application. A non-oily purgative would assist the removal of the BHC from the intestinal tract.

Dog

Unlike the cat, the dog is resistant to the toxic effects of BHC. In some experiments carried out by the writer a toxic reaction with convulsions was induced by an oral dose of 0·8 gramme BHC per kg., but doses as high as 1 gramme per kg. failed to cause death. The application of a 5 per cent. BHC soap paste to the scarified skin of a dog failed to induce a systemic reaction, but caused a transient irritation of the abraded area as shown by excessive scab formation ; normal resolution, however, was not retarded. A 5 per cent. BHC dusting powder is being extensively used for tick control, and dogs have been frequently immersed in 0·5 per cent. BHC without ill effect.

Toxic symptoms first appear four to five hours after ingestion of the insecticide, and consist of hypersensitivity, and a periodic jerking of the head, with profuse salivation. The dog may vomit, there is polyuria, and the nervous spasms increase in severity until the animal is seized by an opisthotonic convulsion of one to two minutes' duration. Convulsions, which occur from 5 to 12 hours after the administration of BHC, may be induced by some stimulus such as noise, or giving the dog exercise. During the period of the excitement stage of the reaction there may be inco-ordination and evidence of some interference with vision. The excitement stage with its danger of convulsions passes after 12 hours to a period of depression lasting three to four days.

The toxic reaction just described followed the oral administration of coarsely ground BHC in capsules. It is possible that the accidental ingestion of a BHC suspension or emulsion might shorten the period between ingestion of the insecticide and the appearance of symptoms.

Treatment would be similar to that recommended for the cat. The prognosis should be good if the animal survives the first 12 hours of the reaction.

Cattle

Wilson (1948) fed BHC at a dosage rate of 0·5 gramme per kg. and caused the death of a calf ; doses of 0·25 gramme per kg. were tolerated without serious toxic effects. The belly and perineum of calves and adult cattle have been sprayed experimentally with emulsions containing 2·5 per cent. BHC by members of the Cooper Technical Bureau, and the bodies of cattle have been covered with 5 gallons of 2 per cent. BHC (Graham, 1949) without ill effect, in both cases. However, the use of a spray containing 1·5 per cent. gamma BHC, which is approximately equivalent to 12 per cent. BHC, was lethal to cattle (U.S.D.A. Report, 1949). A 5 per cent. BHC dusting powder is a standard treatment for lice. Cattle have been dipped extensively in 0·5 per cent. BHC.

Early symptoms include dullness, anorexia and hyperaesthesia. Later the animal staggers, grinds its teeth, salivates, and makes frequent attempts at micturition. In a severe reaction there is inco-ordination and collapse, and convulsions appear with increasing frequency and severity. McEnerney (1951) describes the symptoms of a toxic reaction in calves following the accidental ingestion of Lindane (99 per cent. gamma isomer). The animals reacted within an hour of taking the insecticide and commenced staggering and salivating ; later they collapsed and struggled on the ground, their necks were arched backwards, and they paddled with the hind feet. Death occurred four hours after the appearance of the symptoms.

The treatment of an animal suffering from BHC poisoning would be symptomatic and aimed at keeping it quiet. The writer is not aware of any published report on the value of calcium borogluconate as an antidote to BHC. In view of the scarcity of information it is difficult to assess the progonsis of a toxic reaction ; as a general rule death is more rapid than is the case with DDT. Where BHC with a high gamma isomer content is being used, survival for 12 hours after the onset of symptoms would suggest eventual recovery.

Sheep

An oral dose of 0·5 gramme per kg. of BHC can be lethal to sheep, and 0·25 gramme per kg. can induce toxic symptoms. In both cases the BHC was given suspended in water, using a stomach tube (Jolly & Kane, 1950). Sheep and lambs have been sprayed experimentally with 5 per cent. BHC, and large numbers have been dipped in 2 per cent. BHC without ill effect.

Toxic symptoms may appear within an hour of the administration of the insecticide. Violent jerking of the head and neck, salivation and rapid backward movement ending in collapse, typify the reaction. Frequent opisthotonic convulsions, lasting one to two minutes, occur. The critical phase appears to be six to nine hours after the onset of the symptoms, although death may be delayed until 18 hours. The animal is hypersensitive and liable to develop nervous spasms for 30 hours, after which it becomes depressed for a period of three to four days.

Treatment would be symptomatic and the prognosis favourable if the animal survived 18 hours after the commencement of the reaction.

It is appropriate to observe here that lameness after dipping in BHC and DDT dips has been reported. This has been shown to be due to contamination of used dipping washes with the micro-organism *Erysipelothrix rhusiopathiae* ; it is not due to any toxic effect of the insecticide. A full account of this condition is given by Whitten, Harbour and Allen (1949).

Goats

From the limited information available the tolerance of the goat to BHC is thought to be similar to that of the sheep.

Horses and Pigs

There is little published evidence on the tolerance of the horse and pig to BHC by mouth. Costa *et al.* (1947) suggest that it is the same as that for cattle. Thoroughbred mares and foals have been sprayed about the belly and perineum with 2·5 per cent. BHC, and the body surface covered with 0·5 per cent. BHC without ill effect. A 5 per cent. BHC dusting powder is used, in practice, for lice control. Pigs have been sprayed repeatedly with 1·5 per cent. BHC without ill effect (Bushland *et al.*, 1948).

The writer is unaware of any detailed information on the toxic symptoms of the horse or pig, and it can only be assumed, therefore, that a toxic reaction is similar to those observed in other animals.

Poultry

Chickens withstand dusting with 5 per cent. BHC without ill effect. However, in addition to normal toxicity hazards, there may be a taint attributed to BHC in the eggs and flesh of chicken which have ingested the insecticide. Black (1950) fed chickens for six months with varying amounts of BHC. He observed that while amounts of 10 mg. BHC per day failed to taint flesh, 8 p.p.m. could be detected in the egg. Work conducted by the Cooper Technical Bureau has shown that chickens could be liberally dusted with 5 per cent. BHC without taint of eggs or flesh, provided care was taken to prevent the dust contaminating the food or that grain was not fed from contaminated pen litter.

Turkey poults appear occasionally to be more susceptible to BHC toxicity than are chickens. The writer has subjected

turkey poults to liberal dusting with a 5 per cent. BHC dusting powder without ill-effect, but cases of losses have been reported from the field when similar 5 per cent. BHC dusting powders have been used.

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AUJESZKY'S DISEASE IN PIGS IN NORTHERN IRELAND

BY

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One of the puzzling features in the epidemiology of Aujeszky's disease is the means by which the virus survives between outbreaks. In Northern Ireland sporadic cases have been recorded in a variety of animals and Lamont (1946) gave details of 23 outbreaks involving cattle, sheep, pigs, dogs and a cat. The mode of natural infection is not known definitely, but it is generally considered that infection takes place through a break in the continuity of the skin or mucous membrane. The exact manner in which domestic animals come in contact with the virus is unknown. The sporadic nature of the disease in Northern Ireland suggests a natural reservoir of some kind. Rats have been implicated as a source of infection by many workers and as long ago as 1908 Balas reported the presence of Aujeszky's disease in rats. Lamont (1946) was able to infect rats readily under experimental conditions, but because of its high susceptibility it is unlikely that the rat can act as a natural reservoir though its rôle as a potential transmitting agent to domestic species is not disputed. Shope (1935) considered that the pig was the natural reservoir though the work of Lamont (1946) on the serum neutralisation test, using pig blood, does not support the view that the pig acts in this capacity in Northern Ireland.

The symptoms in domestic animals other than the pig are spectacular and sufficiently characteristic to permit the recognition of Aujeszky's disease on clinical grounds alone. However, in the pig the disease is only exceptionally characterised by the pruritic syndrome and the usual manifestations are sufficiently variable to present considerable difficulties in diagnosis without laboratory aids. Three outbreaks have been diagnosed recently in pigs in widely separated areas in Northern Ireland. The disease in all cases was confined to one litter while other pigs on the infected farms at the time of the outbreaks remained healthy. The outbreaks presented interesting features which were considered worth recording.

Outbreak No. 1

This involved a litter of eight pigs about 14 weeks old. The owner first noticed that nearly all the pigs were developing diarrhoea and slight inappetence. This was followed by constipation in two to three days. At the time of examination two were dead; three visibly sick, and three apparently normal. Temperatures of the affected pigs varied from 104·6 to 105·2° F. They were restless and uneasy and had a tendency to keep walking round the pen. Some inco-ordination was apparent. Spasms of fine muscular tremors were noted and there was marked loss of appetite. The owner reported that each of the two pigs which died had shown similar symptoms and had died in a convulsive fit. No further deaths occurred; the sick animals regained their appetite and the inco-ordination disappeared within about three days, but they were still inclined to walk about the pen much more than the others. In addition, the skin appeared to be very sensitive and the pigs scratched themselves frequently though they did not confine their attentions to any one area of the skin. This skin irritability lasted for about two weeks. The rate

of growth in all the pigs was adversely affected and eventually the owner sold them.

Three dead rats were found in the sty between four and seven days before the occurrence of symptoms in the pigs.

Post-mortem examination did not reveal any gross pathological changes of significance except a marked congestion of the brain and meninges. Bacteriological examination was negative and the diagnosis was based on the biological test, using rabbits.

Outbreak No. 2

This involved a litter of 10 four-week-old pigs. One dead pig and one sick pig were submitted to the laboratory for examination. The sick pig had a temperature of 106·4° F. There were marked signs of respiratory distress and profound nervous symptoms. The pig was unable to stand and sat up like a dog, any forced movements causing it to fall over on its side in which position it made feeble paddling movements with all four limbs. Muscular tremors and clonic spasms of groups of muscles were seen. Epileptiform convulsions became frequent with nystagmus, champing of the jaws and frothing at the mouth. Death occurred in a few hours.

Post-mortem findings were negative and diagnosis was based on biological tests. It was ascertained subsequently that the whole litter had died after showing symptoms similar to those described above. There was no evidence of visible illness affecting rats on this farm.

Outbreak No. 3

In this case a litter of 11 pigs (average weight per pig about 75 lb.) was affected. Over a period of six days three pigs showed symptoms, one died and in an attempt to salvage the other two they were sent to the local abattoir. During this period all the pigs in the litter were very restless and not eating to capacity. The clinical cases all had fairly constant symptoms. First they became very empty-looking though still inclined to eat some food. Later the appetite was completely lost and the pigs began to wander aimlessly around the pen. At this stage the head was carried to one side, the animal appeared to be blind, nystagmus was evident and the voice was lost. There developed a measure of inco-ordination which first affected the forelimbs though the pig could still shuffle round the pen on its knees. Later the inco-ordination spread to the hind legs and complete paralysis was present 24 to 36 hours after the first signs of inco-ordination were noticed. The highest temperature recorded was 104° F.

Discussion

The diagnosis in all cases was based on a biological test using rabbits and the production in this animal of the typical pruritic syndrome. The brain and spinal cord from the suspect pig were removed. If the material was fresh, direct inoculation was carried out; otherwise, the material was stored in 50 per cent. glycerol saline for 48 hours, which was sufficient to destroy contaminating organisms. Small pieces of brain and spinal cord were emulsified in a Griffith's grinding tube. Rabbits were injected either intracranially or subcutaneously. In the former case the inoculating dose was 0·2 ml. and in the latter 1 ml. It was found that irrespective of the route employed for the primary injection the rabbits died without showing the characteristic pruritus and it was only after the second or third passage that this characteristic symptom was produced. By the intracranial route the primary inoculation caused death within 24 hours. After passage, however, death occurred on the third or fourth day.

The foregoing report indicates some of the variations that can be met with in Aujeszky's disease in the pig. It is assumed that in the first outbreak the dead rats were the source of virus but in the two other outbreaks the source was not traced. The serious nature of the disease in the sucking pig is indicated by the fact that in the litter affected at the age of four weeks mortality was 100 per cent. The measure of resistance of the older pig is reflected in the histories of the two other outbreaks. In view of the variable clinical picture and low morbidity and mortality in older pigs it is possible that outbreaks of Aujeszky's disease may not be recognised. In the outbreaks recorded the salient features were the restlessness and inco-ordination in the older pigs, only a slight rise in temperature, nystagmus, low morbidity and recovery of a proportion of the clinically affected cases. In younger pigs, however, the profound nervous symptoms, convulsions and high mortality suggest the presence of Aujeszky's disease.

The behaviour of the virus on primary isolation is also worthy of comment. Intracranially in the rabbit the inoculation of the suspect material caused death within 24 hours, without producing characteristic symptoms of Aujeszky's disease. This result might be attributed to trauma and unless in such cases further passage is made Aujeszky's disease may go undetected. Even when the primary inoculation is subcutaneous and consequently trauma can be ruled out as the cause of death, further passage is necessary in order to demonstrate the characteristic clinical picture of Aujeszky's disease in the rabbit.

Acknowledgments.—The thanks of the authors are due to the following veterinary surgeons, Messrs. McEvoy, Geary and McCartney, who provided the material and much of the clinical history material on which this report is based.

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EIRE RELAXES IMPORT BAN ON HORSES

The Irish Press, of January 19th, reports that the Department of Agriculture's ban on the import of horses from Britain, imposed following widespread outbreaks of foot-and-mouth disease in this country, is to be relaxed in cases where certain veterinary requirements can be met. "The modification of the ban is understood to be the result of representations made to the Department by bloodstock breeders and racehorse owners and trainers," adds the *Press*, and continues: "This is the season when owners in England send their mares to stud farms in this country, and were the ban to remain in force about 30 Irish studs would be adversely affected. At Mr. Joseph McGrath's Brownstown stud, for example, where last year's Derby winner, Arctic Prince, is at stud, about 50 per cent. of the mares served normally come from England. Other well-known sires at this farm (each with a 400 gns. fee) are Windsor Slipper and Solar Slipper. Retention of the ban would also have prevented Irish horses from filling many engagements during the English National Hunt season (ending next April). Many owners and trainers have horses entered for the big jumping engagements at Manchester, Cheltenham and Aintree in the coming months, including, of course, the Grand National.

"Particulars of the veterinary requirements to be met have not yet been announced."

CLINICAL COMMUNICATION

TRANSTHORACIC REPAIR OF DIAPHRAGMATIC HERNIA IN A SIAMESE KITTEN

J. E. M. SPELLMAN, M.R.C.V.S.,
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Subject.—A four-months-old Siamese kitten, male.

History.—The kitten had been struck a blow of some violence by the owner's car, but it was his opinion that the car did not pass over it. An X-ray for possible fractures, taken on the same day, gave negative results, while the diaphragm line in this plate appeared to be unbroken. One month later, however, the kitten was returned with the following symptoms: there was a considerable orthopnoea and cyanosis; rest was taken in a sitting position; respirations were abdominal and heaving in character; there was some loss of weight.

Diagnosis.—Rupture of the diaphragm with hernia. This was confirmed by X-ray after barium meal. Owing to the smallness of the patient it was not possible to locate the site of the rupture accurately. The thoracic cavity appeared two-thirds filled by viscera. The airshadow was correspondingly reduced. In view of the value of the animal it was decided to attempt repair.

Anaesthesia.—The writer is deeply indebted to Dr. G. Houseman, D.A., of Melbourne, for the administration, which lasted for three and a half hours and was perfect throughout from the surgical viewpoint. Dr. Houseman's account of the anaesthesia is as follows:—

Induction.—Anaesthesia was induced with Thiopentone and Flaxedil. The patient was then intubated and anaesthesia maintained with a mixture of 70 per cent. nitrous oxide and 30 per cent. oxygen.

Maintenance.—Controlled breathing was maintained throughout the operation, using the closed technique, with carbon dioxide absorption. For this purpose a ½ lb. soda lime cannister (Water's pattern) was used. Occasionally cyclopropane was added to the anaesthetic mixture in order to maintain control of the respirations.

Preparation.—The left chest wall was clipped, shaved and disinfected with Cetavlon. Five hundred thousand units of crystalline penicillin were given intravenously.

Site of Incision (rib and space numbers counted from the last rib forward for easy recognition).—The fifth intercostal space between the fifth and sixth ribs. This site was chosen as it would provide access to the injury from the abdominal aspect should it be necessary to vary the approach during operation. An incision at this point eliminates rib resection as it is easily dilated by retractors.

Operation.—An incision 3 inches long was made through the skin and subcutaneous tissues down to the intercostal muscles, haemorrhage being rigidly controlled. The intercostals and pleura were then incised, care being taken to avoid the intercostal vessels and also to allow a sufficiency of tissue for subsequent closure. Upon entering the thorax caponisation retractors were used to provide adequate access. It was apparent that the stomach, liver, and small intestines had entered the thorax. The first thing to be seen was a mass of omentum and small intestines lying immediately beneath the incision. Some difficulty was experienced in returning these through the rupture into the abdominal cavity. This was overcome by the use of swabs attached to haemostats, one portion of bowel being pushed through the rupture and held in position in the abdomen while a second portion was returned in the same way. By the time the omentum and intestines had been cleared from the thorax it was seen that the entire liver lay in the right thorax. This was returned to the abdomen using the same swab and haemostat technique. Digital manipulation was impossible in view of the restricted space available and the friability of the liver.

During the return of the liver, swabs were packed into the abdomen attached to haemostats to prevent return of bowel into the chest. Some haemorrhage which occurred from the liver during this manoeuvre tended to gravitate into the right thorax. This was controlled by packing off the right chest with swabs. At this stage the shape and extent of the tear of the diaphragm were visible. The tear commenced on the right side where the attachment to the wall was severed, continued across to the left side ½ to ¼ inch from the sternal attachment, then dorsally for ¾ inch. This was repaired by using 3/60 linen thread on No. 1 ophthalmic needles, 12 sutures inserted at intervals of one-eighth of an inch. In order to secure the right side of the diaphragm, it was necessary to extend the primary incision ventrally to provide an approach to the diaphragm from the abdominal side. The final two sutures were inserted in this manner. Retaining swabs were then removed from the abdomen and the packing removed from the right chest. Closure of the extended portion of the primary incision which had given access to the abdomen followed, using continuous 3/0 plain catgut. The intercostal muscles and pleura were then closed together by continuous catgut sutures, one suture being commenced at the dorsal extremity of the wound, the second suture from the ventral extremity, the two meeting in the middle of the incision. At this point the lungs were fully inflated by the anaesthetist; with the lungs inflated the two ends of the continuous suture were tied off, obliterating the small space (1/10 inch) which had been left for the expulsion of air, thus sealing off the thoracic cavity and restoring negative intrathoracic pressure. The subcutaneous tissues were dealt with by a second layer of continuous catgut suture and the incision was closed with Michel clips.

The administration of anaesthesia was discontinued at this point and open oxygen substituted. The colour of the membranes remained good and normal respiration was quickly restored. A further 600,000 units procaine penicillin in oil were given intramuscularly and the cat was sent home.

Course.—The Michel clips were removed on the sixth day. The temperature remained normal during this period and recovery was uneventful. Since operation the patient has been shown on several occasions and won many prizes.

WEEKLY WISDOM

"The great French clinician Dujardin-Beaumetz is credited with having opened his classes by saying to his students: 'Gentlemen, the science of medicine, which I am commissioned to teach you, does not exist.' In view of the revolutionary progress in pathology and therapeutics since that time, his statement would hardly be valid to-day. However, the following fundamental precept is still true: 'In studying the science of medicine, do not neglect the art of medicine.'

"The present age of technology is apt to encroach somewhat even on the mentality of the physician and impair the human touch—such an important element in the daily battle with disease. . . ."—WEISS, S. (1944.) *Clinical Lectures on the Gall Bladder and Bile Ducts.* (Preface.)

REVIEW

[**Antibodies and Embryos.** By W. F. Rogers Brambell, W. A. Hemmings, & M. Henderson. (1951.) Pp. 108, illustrated. University of London : The Athlone Press. : Sole distributors, Constable & Company, 10-12, Orange Street, W.C.2. Price 12s. 6d. net.]

In October, 1950, W. F. Rogers Brambell, Professor of Zoology, University College of North Wales, gave three Special University of London lectures at the Royal Veterinary College. The substance of these lectures is gathered together and includes a coherent account of the studies made by him and his colleagues at Bangor on the passage of antibodies from mother to foetus in rabbits. It is not claimed to be an exhaustive review of the literature on the transmission of immunity from mother to young in all mammals, but there is an extensive bibliography of the relevant literature which should appeal to those interested in man and the domesticated animals.

The essential problem is concerned with the mechanism of how proteins get through living membranes and the authors' researches in rabbits serve as a model for others to follow. In some species of animals the immunity enjoyed by the newly born is obtained from the colostrum after birth ; it was assumed, in those which acquire it during foetal life, that it came through the placenta and its vessels. This led to the further assumption that a relationship existed between the placental structure and the route of transfer. This view is challenged and as far as the rabbit is concerned it is shown that the transfer of passive immunity from mother to foetus takes place by routes other than the allanto-chorionic placenta. In this rodent the antibodies reach the foetus by way of the uterine lumen and the yolk sac.

We are not so sure of the path the antibodies take in many animals, including man, and there are doubts in our mind of the relative importance of prenatal and neonatal transmission in those species of animal in which both occur. These problems are fundamental and of practical importance to medical and to veterinary science ; the interest extends to those who specialise in embryology, immunology, haematology, paediatrics as well as to the animal physiologist.

It is not easy to evaluate a book which gives an account of research work stretching over a wide field from zoology to medicine and traversing on its way the fields of embryology, immunology, animal disease and haematology. It should make a wide appeal and there ought to be a big demand for a book which is deserving because of its freshness of outlook, its constructive criticism and the information it provides.

The Athlone Press is a comparatively new venture of the University of London, and this attractive volume is a credit to the publishers.

FOWL PEST CONTROL IN LANCASHIRE

N.F.U. Tribute to Work of Ministry's Officers

At the recently held annual meeting of the National Farmers' Union, Mr. R. Farringdon, representing the Lancashire Branch, who described himself as a "recent victim" of the fowl pest epidemic, paid tribute to the Diseases of Animals Committee for the work it had done in coping with the epidemic, and to the Ministry of Agriculture's veterinary corps for the creditable work it had done in all parts of Lancashire over the past year.

"Anyone who has seen this dreaded disease will appreciate that the most stringent and ruthless measures are necessary to prevent or eradicate it" he said, and added that the policy to ban imported poultry in this country was the right one to pursue.

REPORT

[**New Zealand Veterinary Services Council.** Fourth Annual Report for the Year Ended March 31st, 1951.]

The Fourth Annual Report of the New Zealand Veterinary Services Council ended March 31st, 1951, has come to hand.

In this nine-page report the work of the Club Practitioner and his relationship with the Council is discussed. The Club Service is expanding with a total of 56 clubs throughout the country and with the addition of 20 qualified officers during the year. The Council has granted 14 new bursaries to Sydney where 52 students are now in training. Those in the final year are given extra-mural training in New Zealand before qualifying. Post-graduate study for the New Zealand Veterinary Service has taken the form of:—

1. An exchange system with other countries, though this has not yet been brought to completion.
2. A short-term overseas scholarship.
3. A special post-graduate scholarship to the U.S.A.
4. A British Council bursary.
5. A special grant for clinical studies ; and
6. Refresher courses within the country at the Ruakura Research Station.

The report mentions a 15 per cent. rise in salary to the veterinary staff.

Certain legislatory procedures are outlined and are of interest.

1. An amendment to the Stock Act to regulate the manufacture of biological products within the Dominion.
2. An amendment to the Veterinary Surgeons Act to allow the Council to recognise individuals rather than the status of veterinary schools.
3. A report that the Government consider that non-Governmental veterinarians be employed in part-time work of the Department of Agriculture when required. This would be similar to the position now obtaining in the United Kingdom.

The balance sheet shows the source of money used for this service, mainly contributions from the various agricultural industry boards with a £1 for £1 subsidy from the Government.

The report as a whole shows a healthy state of affairs in the new organisation for rural veterinary practice in New Zealand.

C. S. M. H.

TURKISH LIVESTOCK MISSION

A Turkish Livestock Mission recently visited this country on the final stage of a European tour, during which the members inspected pedigree cattle and sheep. The purpose of the Mission was to see what breeds might be suitable for introduction into Turkey and whilst in this country some of the leading breeds were seen. The Cattle Breeding Centre and the National Institute for Research in Dairying near Reading and the Animal Research Station and the University Farm at Cambridge, also were visited.

* * * * *

THE FARRIERS' COMPANY

Major G. A. Warley, as Master, presided at a recent Court Dinner of the Farriers' Company. Among the guests were the Bishop of St. Albans; Professor J. G. Wright, F.R.C.V.S., President of the Royal College of Veterinary Surgeons ; Mr. C. W. Boyce, F.C.A., Chairman of the Institute of Chartered Accountants; Mr. J. B. Braithwaite, Chairman of the London Stock Exchange; Air Chief Marshal Sir Leslie Hollinghurst, K.C.B., K.B.E., D.F.C.; and Brigadier J. G. Smyth, V.C., M.C., M.P.

The toast of the ladies and other guests was proposed by Mr. Montague Berryman, K.C., and replied to by the Bishop of St. Albans. The toast of the Company was proposed by Mr. W. J. Brown, and the Master replied.

BRITISH VETERINARY ASSOCIATION HONOURS THE LATE MR. H. W. STEELE-BODGER, M.R.C.V.S.

An Extraordinary General Meeting of Members of the Association was held on Friday, February 1st, 1952, at the conclusion of the Council meeting, at the Connaught Rooms, Great Queen Street, W.C.2. The meeting was convened to confirm a resolution unanimously passed by Council that Mr. Harry Steele-Bodger be elected an Honorary Member of the Association.

The President, Mr. Alan J. Wright, was in the chair, and welcomed to the meeting Mrs. Steele-Bodger, Mr. and Mrs. Alasdair Steele-Bodger (son and daughter-in-law), Mr. Michael Steele-Bodger (son), Rev. John Steele-Bodger (brother), and Mrs. G. N. Gould. The President of the Royal College of Veterinary Surgeons, Professor J. G. Wright, and the Registrar, Mr. W. G. R. Oates, were also present.

After the notice convening the meeting had been read by Mr. F. Knight (Secretary) the resolution was proposed and seconded, respectively, by Mr. G. N. Gould and Dr. W. R. Wooldridge, who made the proposal at the Annual General Meeting at Eastbourne last September. Under the constitution it was not possible to pass it then, but the meeting accepted it as a recommendation to Council. The Extraordinary General Meeting was convened by the Council so that the obvious wish of the members could be put into effect as soon as possible.

The President called upon Mr. Gould to move the following resolution:—

"That Mr. H. W. Steele-Bodger, M.R.C.V.S., be elected an Honorary Member of the Association."

Mr. Geo. N. Gould: I greatly appreciated the honour given me by the President to propose this resolution. There is no need for me to reiterate the tribute which I attempted to pay in *The Veterinary Record* to the memory of one whom every one of us would call a very great member of this profession and a very great veterinary surgeon. I am quite certain that there will be tributes to follow to which you will listen with interest. Thinking of the great work done by Harry Steele-Bodger in connection with the publications of the Technical Development Committee brought to my mind the neglect of the Association to give him due honour a long time ago, but this omission is being repaired. Mr. Steele-Bodger was very happy at the thought that the Association had recognised the work he had done.

With these few remarks I have great pleasure in proposing the resolution.

Dr. W. R. Wooldridge: In the 1930s a breath of fresh air came into the Council of the Association and the Committees at Gordon Square. That breath of fresh air carried with it the removal of cobwebs and the disturbance of other ties round the profession. It gathered momentum: from time to time it accomplished great things. That breath of fresh air was Harry Steele-Bodger, who developed from an initiate into this Council into probably its greatest leader. He carried on in the early days of the war in Council, in Committees, in private conversations, in discussions with Ministers and high-powered Civil Servants; wherever he was he had a striking method of putting the argument for the profession across to the other side. He always had that confidence which conveyed to his opponents the picture he was trying to convey, and he got further in his short span within this Association than many another has done in a much longer period of service

Unfortunately that period has terminated too soon. We here this afternoon have the pleasure of conveying our thanks to him which, alas, we cannot do personally, but we have the satisfaction of knowing that he was aware that we intended to do this. To-day I think we should go a little further and say to his wife and family that those of us who were associated with Harry and knew the tremendous strain under which he put himself continuously throughout his period of service, realise how much he owed to them; we realise also how fully he appreciated his indebtedness to them, for never was a husband more certain of what he owed to his wife, to his colleagues and to his children than "S.B."

With these few words may I sorrowfully but yet gratefully second this resolution.

The resolution was carried unanimously, and in silence.

Professor J. G. Wright, President, R.C.V.S.: We of the Council of the Royal College of Veterinary Surgeons thank you for the privilege of allowing us to be present on this occasion when you do honour to the memory of Mr. H. W. Steele-Bodger. He was for a number of years a colleague of ours also and during that time we also found him to be a man of the sterling qualities enunciated by Dr. Wooldridge and we would like to associate ourselves with the words expressed by Dr. Wooldridge. We found him to be a man of sterling quality, a man of firm convictions, yet of such fluidity of mind that he was open to conviction when he was wrong. That is a sign of greatness amongst statesmen. He will always be remembered for his tremendous capacity for friendship.

We are delighted to be associated in this very small measure with the honour you are doing this afternoon to our beloved colleague, Steele-Bodger.

The President (to Mr. Alasdair Steele-Bodger): I am proud and honoured, Alasdair, acting on behalf of this Association, to present to you this Certificate of Honorary Membership of this Association of your father. We are deeply and sincerely grieved that he is not here to receive it. He is a worthy recipient and it is but a small token of the esteem in which this Association and this profession hold him. It is a minute repayment of the great debt which both owe him. "S.B.," as he was known to so many of us, loved his life to the full, he gave much more to life than he ever thought of taking out of it, he was always striving to work for and promote the interests of the whole profession and particularly this Association which he loved so much. I am sure, Alasdair, you, your mother, brother and other members of the family, indeed must be proud of him, and I only hope sincerely that the profession can in the future produce men of his sterling worth, men of his calibre, of his zeal and enthusiasm and energy, also possessing his fighting qualities and his deep love of the profession.

I have very much pleasure in presenting to you this Certificate of Honorary Membership of the British Veterinary Association.

Mr. Alasdair Steele-Bodger: It is indeed a great honour not only to my father but to my mother, my brother and myself that you should see fit to make him an Honorary Member of your Association. I remember some years ago when Professor Wooldridge similarly was honoured, his telling me that he considered it to be the highest award that the profession could make to one of its members and I am perfectly certain that he meant it. He knew that he was going to be made an Honorary Member and I can assure you he really did appreciate it as he had said. We miss him, and I gather you miss him too.

We really are most grateful and my mother wishes me to say that she has thoroughly enjoyed all the work that my father did for the Association: he enjoyed it and she enjoyed it with him, and I am quite certain that we shall always be grateful to you for the honour you have done him.

The President: That concludes the business of the meeting.

BULLS TO RESTOCK BECCLES BREEDING CENTRE

Bulls to restock the Milk Marketing Board's Cattle Breeding Centre at Beccles were chosen at a meeting of the centre's Advisory Committee in Norwich recently. It will be remembered that the centre's former stud of 37 was destroyed in November because of an outbreak of foot-and-mouth disease. From a list of superior sires placed before the Committee by Mr. W. E. Bowden, who is responsible for the acquisition of bulls for the Board, 10 British Friesians, four Ayrshires, three Jerseys and five Dairy Shorthorns were decided upon and a provisional selection of Red Polls was made. Mr. D. A. Cobbold, who presided, said that both the Board and the Advisory Committee were finding it difficult to fill their requirements for the Red Poll breed, and appealed for any suitable bulls in the area to be offered.

Mr. G. F. Smith, Senior Veterinary Officer at the centre, said that while there had been considerable dislocation of the service as the result of the restrictions, the position was now greatly improved.

The Committee discussed the possibility of mating proven sires to high-yielding cows in the area with a view to inspection of the progeny in the hope that bull calves might be produced suitable for ultimate use in artificial breeding. The Chairman expressed the opinion that many owners of pedigree animals would be pleased to co-operate in this way.

XUM

IN PARLIAMENT

Riding Establishments (Amendment) Bill

On Friday of last week the House of Commons discussed for a short while the Riding Establishments (Amendment) Bill, a private Member's Bill presented by Mr. G. B. Finlay, Conservative Member for Epping, with the support of Conservative and Labour Members.

The purpose of the Bill is to enforce the registration of horse-riding establishments, and Clause 3 (Inspection of Premises) states: "Without prejudice to the provisions of section one of the Riding Establishments Act, 1939 (under which a local authority may authorise in writing any duly registered veterinary surgeon to inspect any premises which they have reason to believe are used as a riding establishment), it shall be the duty of every local authority in the manner provided by the said section to cause the inspection of any premises within their area registered for the purposes of this Act not less than once in each year."

It is proposed that the ensuing Act shall come into operation on January 1st, 1953, and that it shall not extend to Scotland or Northern Ireland.

In the course of his speech in moving the second reading of his Bill, Mr. Finlay said that it aimed to put teeth into the Act of 1939, which was, for practical purposes, ineffective, by enforcing registration of riding establishment premises—that was in Clause 1—for a small fee, a 5s. fee, as set out in Clause 2. Hon. Members would notice that this was no requirement in the character of licensing. There was no question of refusing registration. It was an automatic process which followed application to be put on the record.

The object was to ensure that local authorities, the enforcing authorities, knew where riding establishments were. It might seem strange that they should not, but when one reflected on it, it was, perhaps, not as peculiar as might at first seem to be the case, because local authorities were comparatively large corporate bodies, and, without having registers containing particulars of these establishments, it was difficult for them to know where they were.

The second main object of the Bill was to ensure that local authorities had riding establishments within their areas inspected at least once per annum. There was evidence that established that local authorities did not in all cases, although they did in some, exercise their powers.

The Bill was under discussion when the debate was automatically adjourned.

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QUESTIONS

Swine Fever (Compensation)

Mr. Baker (January 29th) asked the Minister of Agriculture whether he will now consider introducing compensation for losses from swine fever.

Sir T. Dugdale: No. I cannot accept the principle that farmers should be compensated because they suffer losses on account of disease. Compensation is payable under the Diseases of Animals Act in respect of animals slaughtered by order of the Minister, but as it has been found by experience that swine fever cannot be eradicated by following a slaughter policy other measures are now adopted for dealing with this disease.

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Rabbit Traps (Scotland)

Sir William Darling (January 29th) asked the Secretary of State for Scotland what progress he has made in finding a suitable rabbit trap to replace the gin trap; and how far experiments carried out with the Miller Killmore trap show that it may be suitable for his approval under Section 50 (2) of the Agriculture (Scotland) Act, 1948.

The Secretary of State for Scotland (Mr. James Stuart): Since August, 1948, 15 new model rabbit traps have been submitted by eight inventors for consideration as alternatives to the gin trap but, unfortunately, none has proved suitable for statutory approval under the provisions of the 1948 Act. Field tests of the Miller Killmore trap have shown that it is a humane killer, although it lacks the degree of efficiency of the gin trap. The trap has real possibilities, however, and further tests will be carried out as soon as an improved model on which I understand the inventor is at present working becomes available.

Lieut.-Colonel Sir Thomas Moore: Does not the Sawyer trap fulfil all the requirements of efficiency and humanity?

Mr. Stuart: The Sawyer trap is the other trap which definitely has possibilities, and it is also being examined further.

Dog Licences

Mr. C. S. Taylor (January 30th) asked the Assistant Postmaster-General if he will give figures showing the number of dog licences issued in Great Britain during the past five years.

Mr. Gammans: The number of dog licences (including licences for hounds) issued in Great Britain during the five years ended March 31st, 1951, is:—

Year ended March 31st,	
1947	2,792,863
1948	2,972,609
1949	3,050,060
1950	3,089,583
1951	2,921,534

NOTES AND NEWS

Diary of Events

Feb. 13th.—Meeting of the Executive Sub-committee of the Editorial Committee, B.V.A., at 36, Gordon Square, W.C.1, 2.30 p.m.

Feb. 14th.—Glasgow University Veterinary Medical Association Annual Ball, at The Rhul, Sauchiehall Street.

Feb. 15th.—Meeting of the Society for the Study of Animal Breeding, at the Wellcome Research Institution, 183-193, Euston Road, London, N.W.1, 2.30 p.m.

Feb. 15th.—Meeting of the Lincolnshire and District Division, B.V.A., at Peterborough (Grand Hotel), 2.15 p.m.

Feb. 16th.—Meeting of the Biochemical Society, in the London School of Hygiene and Tropical Medicine, Keppel Street, W.C.1, 11 a.m.

Feb. 18th.—Lecture by Professor Marc Klein (Strasbourg) at Reading University, 5.30 p.m. (See Notice.)

Feb. 19th.—Annual General Meeting of the Eastern Counties Division, B.V.A., at Norwich (Bell Hotel), 11 a.m.

Feb. 21st.—Meeting of the Herts and Beds Division, B.V.A., at St. Albans (70, Holywell Hill), 2.30 p.m.

Feb. 22nd.—Liverpool University Veterinary Society's Annual Ball, in the Students' Union, Bedford Street, 8 p.m.

Feb. 27th.—Annual General Meeting of the Lancashire Division, B.V.A., at Manchester (Grand Hotel), 2.30 p.m.

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PERSONAL

Forthcoming Marriage.—Galloway—Mackenzie.—The engagement is announced of George Lindsay Galloway, younger son of the late Mr. J. J. Galloway and of Mrs. Galloway, formerly of Eaton Bishop, Herefordshire, and Jamesina Mackenzie, M.R.C.V.S., twin daughter of the late Mr. Murdoch Mackenzie and of Mrs. Mackenzie, Torridon, Ross-shire.

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Marriage.—Pfob—Robertson.—On January 5th, 1952, at Glasgow, Lewis Stanley Pfob, of the Colonial Veterinary Service, Uganda, only son of Mr. and Mrs. S. Pfob, "Coral Mount," Kirkintilloch, Dunbartonshire, to Moira June Robertson, younger daughter of Mr. and Mrs. William Robertson, 36, Ripon Drive, Glasgow, W.2. Among those present were Sir Hugh Roberton, LL.D., and Allan B. Thomson.

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R.C.V.S. OBITUARY

Blane, William Thomas, 14, Delancey Street, Camden High Street, London, N.W.1. Graduated Glasgow, December 23rd, 1896. Died November 26th, 1951. (Notification just received.)

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CHALMERS BRUCE MURRAY

A Further Tribute

The death of Bruce Murray calls to mind the passing of another young man of great promise, George Lewis Yeatman Ingram, in May, 1914. Had they been spared both men seemed destined to add to the store of knowledge and make their mark in the annals of their profession. Although the circumstances were different it was the same disease which took them away. History records that many young men of great promise have been victims of this fell disease. It may be that, apart from its malign effects, the bacillus of tuberculosis does in some way stimulate the physical and mental faculties to a state of endeavour and persistence far beyond average range.

Bruce Murray came to the Royal Veterinary College in September, 1941. He entered the second year, for he had studied at the Regent Street Polytechnic and gained exemption from the course and examination for the first year. His undergraduate period was not a distinguished one but he did not miss a hurdle and in due course he became an M.R.C.V.S. in the summer of 1945.

He was a modest and rather shy student and a very diligent worker. His health appeared to be good and he was of good physique. His favourite recreation was swimming and in this he excelled. He had the shoulders of a swimmer.

When he qualified—and much to my surprise, for I did not suspect that he was attracted to an academic career—he applied for and was successful in obtaining a junior post in the Histological and Embryological section of the Department of Anatomy. He applied himself to his new task with energy and diligence. He proceeded to the B.Sc. degree in Veterinary Science and later, after two years of intense hard work, he gained the Ph.D. of the University of London. All this meant many late nights in the laboratory and I am afraid that he tried his body sorely and maybe laid the seeds of his subsequent trouble.

About this time Dr. Amoroso was promoted to the Chair of Physiology. My confidence in Murray's capabilities and energy was such that I did not hesitate to recommend that he be promoted to be head of his section. He fulfilled all my expectations. He was a good teacher and administrator and he found time for research.

About two years ago, after a visit with students to a mass X-ray clinic, he was informed that all was not well in his chest. This was a shock to us all, for he was of fine physique. He took the news calmly and entered upon the prescribed regimen of treatment. It appeared that the treatment was successful and there were great hopes of a complete cure. I believe there was a cure, and his sudden passing was totally unexpected and dumbfounded us all. It was the direct result of a surgical hazard such as we must all accept when surgical interference takes place even in a minor form and for investigation only.

Murray was a man who did not make friends lightly; he was never of the "Hail fellow well met" type. He was very shy and reserved but when one got under this reserve and was admitted to his intimate circle no man could gain a more solid or loyal friend. One found him to be of high principle and of great moral integrity and courage.

He was an only son and he was devoted to his parents. They shared in his success and as he advanced he was able to repay their great sacrifice made on his behalf. We have lost a young man of great promise; his parents have lost a devoted son of whom they were justly proud. It is my sincere wish that the knowledge that he reached such eminence and that he was held in high regard by his colleagues and students may in some measure help them in their great sorrow.

J. McC.

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S.V.R. OBITUARY

Jessop, William John, The Cottage, Valebrook, Stonestile Lane, Orc, Sussex. Date of Registration March 15th, 1951. Died January 2nd, 1952.

Stear, William Charles, Aveton Gifford, Kingsbridge, Devon. Date of Registration December 23rd, 1949. Died January 28th, 1952; aged 73 years.

Mr. William Charles Stear

An Appreciation

By the sudden death of Mr. Stear, veterinary practitioner, the South Hams' agriculturists have lost a loyal friend.

The fourth generation of veterinarians, he succeeded his grandfather in the practice 52 years ago.

He was a man of outstanding clinical ability, integrity and high ethical standards.

Mr. Stear leaves a widow, two sons and four daughters. His younger son, Robert, is at present studying at the Royal Veterinary College.

Deepest sympathy is extended to them. J. B.

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VICTORIA VETERINARY BENEVOLENT FUND

"In Memory of Mr. H. W. Steele-Bodger, M.R.C.V.S."

The Secretary of the Fund gratefully acknowledges the receipt of donations from the following:—

Miss D. M. Bodger,
Mrs. G. E. M. Candy,
J. B. Dawson,
Mr. & Mrs. W. Froggatt,
O. V. Gunning,
Mrs. Macdonald-Holmes,
Mrs. P. Macnamara,
Mrs Norton and family,
G. E. Pearce,
South Staffordshire Hunt Pony Club,
Miss M. J. Tavener,

Total received to date £21 10s. *February 1st, 1952.*

Area Eradication Plan for Tuberculosis

Initial Eradication Areas to be Extended in October, 1953

When the area eradication plan for tuberculosis was introduced in October, 1950, it was announced that free tuberculin tests would be given in two large areas, one in South-West Scotland and the other in South-West Wales. At the same time, notice was given of intention to declare parts of these two areas as eradication areas in October, 1952. It was expected that the remaining parts would be ready to be added to the two eradication areas in October, 1953.

In a recent announcement, the Ministry of Agriculture states that good progress with voluntary attestation under the Attested Herds Scheme has been made in both "free-testing areas," and notice is given of the Minister's intention to add the remaining parts of the two areas to the initial eradication areas on October 1st, 1953.

In South-West Scotland, the initial eradication area to be declared in October, 1952, consists of the counties of Ayr, Dumfries, Kirkcudbright, Renfrew and Wigtown and parts of the counties of Argyll and Bute. The remaining part of the "free-testing area" to be added to this eradication area in October, 1953, comprises the counties of Dunbarton, Lanark, Peebles and Stirling.

In South-West Wales, the initial eradication area consists of the counties of Cardigan and Carmarthen (except the Bettws Mountain district) and a part of the county of Pembroke adjoining Carmarthen. The remaining parts of the "free-testing area" to be added to this eradication area in October, 1953, comprise the Bettws Mountain district of Carmarthen, the remainder of the county of Pembroke, and that part of the county of Glamorgan west of the Swansea valley, including the Gower peninsula.

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Progress in the First Year

Considerable progress was made during the first year's working of the plan, particularly in the two "free-testing areas." Over 16,000 herds in Great Britain containing well over half a million cattle were added to the Register of Attested Herds, compared with 9,700 herds containing about 360,000 cattle added during the preceding period of 12 months.

At the end of September, 1951, there were 68,630 attested herds (33,460 in England, 19,290 in Wales and 15,880 in Scotland). These contained over 2,800,000 cattle, or more than 29 per cent. of the total cattle population. The percentages for England, Wales and Scotland separately were 23, 43 and 47 respectively. In addition, there were 8,950 supervised herds (England, 6,100; Wales, 1,500; Scotland, 1,350) containing a further 360,000 cattle. These herds needed only one clear official test in order to qualify for registration in the Register of Attested Herds.

Attested Areas.—Three island areas in which all herds of cattle were attested herds were declared as tuberculosis attested areas with effect from February 1st, 1951. These areas are the county of Shetland, the Scilly Isles and the islands of Arran and Great and Little Cumbrae in the county of Bute.

South-West Wales.—The "free-testing area" contains about 340,000 cattle and consists of the whole of the counties of Cardigan, Carmarthen and Pembroke, and that part of Glamorgan west of the Swansea valley, including the Gower peninsula. The part of the area to be declared an eradication area on October 1st, 1952, consists of the counties of Cardigan and Carmarthen (except the Bettws Mountain district) and a part of Pembroke adjoining Carmarthen.

Satisfactory progress was made during the year. By the end of September 3,682 applications for free tests in respect of herds in the "free-testing area" containing nearly 62,000 cattle had been received. Free tests had begun in 3,137 of these herds. At the first tests the proportion of reactors was 13 per cent. or about one in eight. No reactors were found in 1,612 of the herds, or more than one-half of them.

The position in that part of the "free-testing area" which is to be declared an eradication area on October 1st, 1952, was that application for free tests had been made in respect of 1,965 herds containing over 28,000 cattle. There remained about 1,550 herds containing some 20,000 cattle, mainly in Carmarthen, which were not attested or supervised and in respect of which application for free tests had not been made.

Substantial progress was also made in the rest of the "free-testing area," where applications for free tests numbered 1,717 (34,000 cattle), leaving about 2,100 herds containing 29,000 cattle, mainly in Pembroke, which were not attested or supervised or undergoing free tests, still to be brought in. Particularly good work was done in the Glamorgan section of the area—678 herds (10,000 cattle) had come in for free tests and only 530 herds (about 3,600 cattle) remained to be brought in.

South-West Scotland.—The "free-testing area" contains about 620,000 cattle and comprises the counties of Ayr, Dumfries, Dunbarton, Kirkcudbright, Lanark, Peebles, Renfrew, Stirling, Wigtown and Bute (except the islands of Arran, Great Cumbrae and Little Cumbrae), and in the county of Argyll most of the Kintyre penin-

sula with the Islands of Islay, Jura and Colonsay. This area (except the counties of Dunbarton, Lanark, Peebles and Stirling) is to be declared an eradication area on October 1st, 1952.

In terms of cattle population, the Scottish area is nearly twice the size of the South-West Wales area, and individual herds in it are twice the size of the Welsh herds. In the Scottish area, 1,488 applications for free tests had been received by the end of September. The first free test had been completed in 1,231 cases. The incidence of reactors at these tests was rather less than 15 per cent. compared with 13 per cent. in the Welsh area. In 542 herds, or 44 per cent., no reactors were found.

A considerable number of herds in the area became supervised or attested during the year without the help of the free tests, including a number of herds established as attested herds under Article 6 of the Scheme, which provides for immediate attestation where an infected herd is replaced, subject to suitable safeguards, by attested cattle.

The satisfactory progress made in the prospective eradication area was confirmed by a survey which showed that there were only 265 herds left, containing fewer than 7,000 cattle, which were not attested or supervised and in respect of which application for free tests had not been made. It is anticipated that there will be relatively few herds to be dealt with compulsorily when the eradication area is declared on October 1st, 1952.

In the rest of the "free-testing area" there were about 1,100 herds (32,000 cattle) which at the end of September were not attested or supervised or undergoing free tests.

Further Development of the Eradication Plan.—When the institution of the eradication plan was announced, three areas were mentioned as likely to be suitable for development as eradication areas within the next few years:—

(*a*) Cumberland, Westmorland and the Furness District of Lancashire.

(*b*) The remainder of Argyll and the Lothian and Border counties in Scotland.

(*c*) Brecon, Radnor, Merioneth and Montgomery.

Good progress was made during the year in all three areas, particularly in Cumberland and Westmorland, where the number of attested herds increased by 721 and 220 respectively. At the end of September 52 per cent. of the cattle in Cumberland were attested and 75 per cent. in Westmorland. A fair proportion of the 579 herds added in Lancashire are in the Furness district.

There was a steady increase in the Scottish area, where the proportion of cattle attested advanced from 26 per cent. to nearly 34 per cent., ranging from 19 per cent. in Berwick to 61 per cent. in West Lothian. The proportion in the whole of Argyll increased from 38 to 51 per cent.

In the Welsh area there was a gain of 713 herds in Montgomery and of 330 in Merioneth, increasing the proportion of attested cattle to 38 and 66 per cent. respectively. It was hoped that the capitation bonus, as an alternative to the milk bonus, would result in rapid progress, particularly in Brecon and Radnor. The number of attested herds in these two counties more than doubled. An increase of 202 herds in Brecon raised the proportion of attested cattle in that county to 26 per cent., and of 93 herds in Radnor to 13 per cent.

The announcement concludes: "Progress during the year would have been even greater but for a general shortage of veterinary surgeons, which was more pronounced in the Ministry's whole-time staff than in private practice. Moreover, outbreaks of foot-and-mouth disease, fowl pest and swine fever made heavy calls on the whole-time staff. As a result delays in carrying out official tests for attestation have occurred in some counties. All practicable steps are being taken to minimise these delays, and additional whole-time veterinary officers are being posted to hard-pressed counties as they become available."

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MINISTRY'S AGRICULTURAL SCHOLARSHIPS

The Ministry of Agriculture and Fisheries invites applications for the following scholarships:—

Ten Senior Scholarships for degree or diploma courses in an agricultural subject (degree courses at University Departments of Agriculture, diploma courses at the Agricultural Colleges and the Essex and Lancashire Institutes of Agriculture); or for courses in Veterinary Science at Veterinary Colleges.

Six Extended Junior Scholarships (for those who have already held Junior awards), and

Sixty Junior Scholarships tenable at Farm Institutes for courses not exceeding one year in duration, in agriculture, horticulture, dairying or poultry husbandry.

The scholarships are open to the sons and daughters of agricultural workmen or of working bailiffs, smallholders and other rural workers whose means and method of livelihood are comparable with those of agricultural workmen, and to persons who are themselves *bona fide* workers in agriculture. The value of awards is assessed on a sliding scale according to the circumstances of the parent, or guardian, and the applicant, Senior awards being comparable to State Scholarships. The usual method of selection is by interview, no written examination being held, but candidates must be able to satisfy the Selection Committee that they will benefit by a course of instruction and that they intend to follow an agricultural pursuit on completion of their training. Candidates must have attained the age of 17 years on September 30th, 1952.

Full information about the scheme and forms of application may be obtained from the Secretary (Room 314), 1, Cambridge Terrace, Regent's Park, London, N.W.1, or from the Education Offices of County Councils.

The latest date for submitting completed applications is March 31st, 1952.

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CIVIL SERVICE RETIREMENT AGE: 60 "NORMAL" BECOMES "MINIMAL"

The Chancellor of the Exchequer has notified the staff side of the Civil Service National Whitley Council that he has decided to put into operation forthwith new rules for retirement from the Civil Service, and that the general aim will be to employ all Civil Servants for as long as is practicable. This means that 60 will no longer be regarded as the normal but the minimum retirement age.

In future retirements will take place between the ages of 60 and 65 at the wish of departments. Departments will apply tests of efficiency to Civil Servants as they near the age of 60, and at regular intervals thereafter if they continue after that age. Those who do not reach an acceptable standard of efficiency will be retired, but no stigma will be attached to them in these circumstances. Civil Servants will not be compelled to remain after 60; they may retire either then, or at any time thereafter.

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Tuberculosis (Attested Herds) Scheme, 1950

STATEMENT SHOWING POSITION IN EACH COUNTY AS AT DECEMBER 31ST, 1951

County	Total Cattle as at 4.6.51	Number of Attested Herds as at 31.12.51	Number of Cattle in Attested Herds as at 31.12.51	Percentage of Attested Cattle to Total Cattle
Bedford	48,984	181	10,760	22·0
Berkshire	92,331	737	43,440	47·0
Buckingham	121,185	628	33,870	27·9
Cambridge	34,108	161	9,090	26·7
Isle of Ely	23,332	36	1,920	8·2
Chester	251,247	1,235	57,350	22·8
Cornwall	275,418	1,119	38,389	13·9
Isles of Scilly	1,287	89	•1,287	100·0
Cumberland	226,709	2,773	125,740	55·4
Derby	191,445	651	31,120	16·3
Devon	411,624	1,643	67,360	16·4
Dorset	159,110	1,152	66,350	41·7
Durham	119,258	1,007	34,440	28·9
Essex	131,656	827	44,160	33·5
Gloucester	203,382	1,129	61,060	30·0
Hampshire	156,926	1,278	66,760	42·5
Isle of Wight	21,888	235	9,870	45·1
Hereford	139,533	635	27,970	20·0
Hertford	64,182	428	25,160	39·3
Huntingdon	31,605	53	3,230	10·2
Kent	127,175	761	36,930	29·0
Lancaster	281,010	1,826	70,660	25·1
Leicester	174,334	419	23,210	13·3
Lincoln (Holland)	30,853	15	470	1·5
Lincoln (Kesteven)	75,212	157	7,350	9·8
Lincoln (Lindsey)	173,860	264	12,890	7·4
London	—	—	—	—
Middlesex	8,210	40	2,560	31·2
Norfolk	206,585	648	45,970	22·3
Northampton	162,475			
Soke of Peterborough	7,363	270	17,320	10·2
Northumberland	202,748	582	32,110	15·8
Nottingham	116,515	311	14,400	12·4
Oxford	113,873	786	43,320	38·0
Rutland	21,485	18	660	3·1
Salop	280,257	1,059	58,930	21·0
Somerset	329,401	2,089	104,860	31·8
Stafford	240,728	682	31,930	13·3
Suffolk, East	86,629	397	19,580	22·6
Suffolk, West	43,338	240	15,010	34·6
Surrey	54,412	596	25,530	46·9
Sussex, East	110,983	738	31,770	28·6
Sussex, West	79,150	611	32,740	41·4
Warwick	156,792	547	29,390	18·7
Westmorland	97,030	1,818	75,470	77·8
Wiltshire	209,483	941	68,680	32·8
Worcester	105,750	331	16,840	15·9
York, E. Riding	143,974	189	8,410	5·8
York, N. Riding	256,784	1,578	55,050	21·4
York, W. Riding	350,578	2,262	78,930	22·5
ENGLAND	6,952,266	36,181	1,720,287	24·7

County	Total Cattle as at 4.6.51	Number of Attested Herds as at 31.12.51	Number of Cattle in Attested Herds as at 31.12.51	Percentage of Attested Cattle to Total Cattle
Anglesey	53,179	555	13,430	25·3
Brecon	47,390	512	15,993	33·8
Caernarvon	58,789	1,205	25,020	42·6
Cardigan	77,779	4,275	70,469	90·6
Carmarthen	138,207	5,744	117,793	85·2
Denbigh	100,169	1,087	32,330	32·3
Flint	61,370	339	13,030	21·2
Glamorgan	75,332	690	16,580	22·0
Merioneth	40,369	1,514	29,910	74·1
Monmouth	71,107	398	15,250	21·4
Montgomery	96,991	1,520	43,270	44·6
Pembroke	103,234	2,571	60,840	59·0
Radnor	37,212	230	6,970	18·7
WALES	961,128	20,640	460,870	48·0
ENGLAND & WALES ..	7,913,394	56,821	2,181,157	27·6
Aberdeen	227,510	392	32,130	14·1
Angus	65,612	184	17 490	26·7
Argyll	62,947	1,146	33,650	53·5
Ayr	153,587	2,291	143,760	93·6
Banff	56,110	93	6,360	11·3
Berwick	34,902	114	7,630	21·9
Bute :				
Non-Attested Area ..	5,093	91	4,410	86·6
Attested Area ..	6,036	236	6,036	100·0
Caithness	28,441	198	5,110	18·0
Clackmannan	4,523	42	2,80·0	62·0
Dumfries	105,935	1,768	91,350	86·2
Dunbarton	17,440	285	14,630	83·9
East Lothian	16,435	71	5,460	33·2
Fife	64,362	501	35,990	55·9
Inverness	52,918	305	9,030	17·1
Kincardine	40,169	90	7,190	17·9
Kinross	9,753	61	4,360	44·7
Kirkcudbright	75,789	1,045	66,149	87·3
Lanark	94,703	1,538	80,660	85·2
Midlothian	24,535	282	14,020	57·1
Moray	30,581	90	7,140	23·3
Nairn	8,989	41	2,390	26·6
Orkney	49,597	448	11,170	22·5
Peebles	11,676	235	8,550	73·1
Perth	91,725	412	24,150	26·3
Renfrew	30,173	522	26,010	86·2
Ross-shire	39,929	595	8,610	21·6
Roxburgh	35,669	157	8,110	22·7
Selkirk	6,141	85	2,410	39·2
Stirling	41,213	535	25,509	61·9
Sutherland	9,851	525	3,530	35·9
West Lothian	15,688	205	9,890	63·0
Wigtown	74,642	803	62,780	84·1
*Zetland	7,453	1,818	*7,453	100·0
SCOTLAND	1,600,127	17,204	795,899	49·7
GREAT BRITAIN ..	9,513,521	74,025	2,977,056	31·3

*All cattle herds in Zetland and the Isles of Scilly are attested. This figure represents the number of animals at the last test of the herds.

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BURNS SUPPER AT LASSWADE

On Friday, January 25th, a gathering of about 60, comprising the staff of the Veterinary Laboratory of the Ministry of Agriculture and Fisheries at Lasswade and friends, attended a Burns Supper at Eskgrove. The guests included the Director, Dr. Stableforth, and Mr. J. A. Aldridge, from Weybridge; Mr. J. N. Ritchie; Captain N. Bisset; Professor Jaap, Fullbright Research Professor from Ohio; Dr. Greenwood, Director of the Poultry Research Centre, Edinburgh; Dr. J. Russell Greig; Professor A. Robertson and Mr. R. Hood, of the Royal (Dick) Veterinary School, and several members of the Ministry of Works, including Mr. Kirk, Senior Architect, Messrs. McMyn and Wilson, District Surveyors, Mr. Dalrymple, Superintendent of Works, Mr. Richardson, Supervising Engineer, and Mr. Watson. The Haggis was "piped in" in traditional fashion by Mr. John Ritchie and addressed by Mr. J. E. Wilson, who presided. The "Immortal Memory" was proposed by Dr. Russell Greig, who later recited "Tam o' Shanter" as only he can. His rendering is unforgettable to those privileged to see and hear it. Captain Bisset toasted "The Lassies" in an amusing speech and thereafter the company was entertained to a programme of Scots songs and dancing by the Laboratory choir and team of country dancers, and other artists.

J. E. W.

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The Ministry of Agriculture does not favour the adoption of sale conditions providing for testing of animals purchased at attested markets. Experience has shown, it is stated, that the risk of getting a reactor by purchase is very small.—*Farmers' Weekly*.

ADDRESSES OF DISEASE-INFECTED PREMISES

The list given below indicates, first, the county in which are situated the premises on which disease has been confirmed, followed by the postal address and date of outbreak.

ANTHRAX:

Cheshire.—Dunstan Farm, Dunstan Lane, Burton, Wirral (Jan. 26th); The Hermitage Farm, Kingswood, Frodsham, Warrington; Gad Hole Farm, Prestbury, Macclesfield (Jan. 29th).

Kent.—Lower Deans Farm, Harrietsham, Maidstone (Jan. 28th).

Lancs.—Shaw's Farm, Garstang, Preston (Feb. 1st).

Yorks (*W.R.*).—Home Farm, Kirklees, Clifton, Brighouse (Jan. 28th); Lane House Farm, Greystone Gill, Bentham (Feb. 2nd).

FOOT-AND-MOUTH DISEASE:

Leics.—Ban Land, Frisby on the Wreake, Melton Mowbray (Feb. 2nd).

Yorks (*E.R.*).—Haverflatts Farm, Kirklands Road, Hull (Jan. 29th); Tansterne Grange, Aldbrough, Hull (Feb. 2nd).

FOWL PEST:

Hunts.—West End Farm, Fenstanton, Huntingdon (Feb. 2nd).

Lancs.—(All at Preston): Sunnymead and Taylor's Farm, Chapel Lane, New Longton (Jan. 25th); Balshaw Farm, Drumacre Lane, Longton; Bank Lane End, Warton (Jan. 26th); Gill View, Gill Lane, Longton (Jan. 31st).

SWINE FEVER:

Beds.—Lodge Farm, Turvey (Feb. 2nd).

Bucks.—Palmer's Moor Poultry Farm, Palmer's Moor Lane, Iver (Jan. 28th); Manor House Farm, Chenies, Rickmansworth (Jan. 29th); The Grove, Grendon Underwood (Feb. 1st).

Essex.—Longfield, Grove Road, Rayleigh (Jan. 29th).

Herts.—Dover Field, Goff's Lane, Cheshunt (Jan. 30th); Hambledon, Potters Heath, Welwyn (Feb. 1st).

Kent.—Stone Farm, Saltwood, Hythe (Feb. 1st).

Lincs (*Holland*).—Poplar's Farm Holland Fen, Lincoln (Feb. 2nd).

Northants.—Home Field, Towcester (Jan. 30th); Appletree Farm, Brackley Road, Middleton Cheney, Banbury, Oxon (Feb. 2nd).

Staffs.—Woodfarm, Adbaston, Stafford (Jan. 30th); Brook House Farm, Doxey, Stafford (Jan. 31st); 261, Walsall Wood Road, Aldridge; 26, Oak Road, Shelfield, Walsall (Feb. 1st).

Surrey.—Frosbury Farm, Gravett's Lane, Worplesdon (Feb. 1st).

Warwicks.—435, Shirley Road, Hall Green, Birmingham (Jan. 31st); 57, Wright Road, Saltley, Birmingham (Feb. 1st).

Yorks (*E.R.*).—16, Cottage Holdings, Dunswell, Hull (Jan. 30th); Tythe Farm, Hemingbrough, Selby (Feb. 1st).

Yorks (*W.R.*).—Ash Lea, Green Lane, Scawthorpe, Doncaster (Jan. 29th); 2, Pontefract Road, Cundycross, Barnsley (Jan. 30th).

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LEGAL NOTES

Dog Buried Alive.—At Falkirk, Stirlingshire, Sheriff's Court recently, an 83-year-old man, Samuel Thompson, of Slamannan Road, Avonbridge, was sent to prison for 30 days for cruelly ill-treating his black Labrador dog by burying it while it was still alive and suffocating it. An R.S.P.C.A. officer said that he gave instructions to have the dog's body exhumed.

A veterinary surgeon, Mr. Kenneth Anderson, of Stirling, said that he had exhumed the dog and in his view it had been suffocated by burial. The dog's throat was choked with earth which could only have got there through the dog breathing and sucking in the earth.

Thompson said that he thought the dog had eaten poisonous toadstools and became ill. On the third day he found it lying outside its kennel with its legs stretched out. It appeared to be dead and he buried it in his garden.

Passing sentence, Sheriff MacGregor, K.C., said that it was a "most callous" act of cruelty to a living creature.

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Livestock Export Group.—A general meeting of members of the Livestock Export Group will be held at the Station Hotel, Perth, on Tuesday, February 12th, at 8.30 p.m., when an address on "Animal Health Matters relating to Export" will be given by Mr. J. N. Ritchie, B.SC., M.R.C.V.S., D.V.S.M., who on March 31st becomes Chief Veterinary Officer, Animal Health Division of the Ministry of Agriculture and Fisheries.

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A Montgomeryshire poultry dealer who pleaded guilty to moving about 600 head of live poultry in contravention of the Order prohibiting the removal of live poultry outside a county because of fowl pest and was fined £2, was said by his solicitor to be taking the poultry to London for the Jewish community because they had to be slaughtered in the presence of the Chief Rabbi.—*Meat Trades Journal*.

LANGFORD (SOMERSET) AS A VETERINARY CENTRE

In an interesting feature, the *Bristol Evening Post* of January 24th observes: "Langford, a quiet Somerset village, may become the veterinary centre for the South-West of England. The newly formed Bristol University Veterinary School has linked with the Somerset Cattle Breeding Centre and the Regional Veterinary Laboratory of the Ministry of Agriculture.

"It is a development which will be of great value to the farming community and will be an important factor in veterinary research in this country. The organisation is centred on Langford House, which stands in its own 85 acres of rich pasture land, which is already being farmed along the highest scientific and agricultural lines. In just over a year's time, the first of the 30 to 35 University students will arrive at Langford House. They will then be in the fifth year of the course, and, although no accommodation has yet been found, they are expected to stay while they complete their studies. They will be able to work on diseases in farm animals, the most important branch of veterinary science from the viewpoint of this country. Adapting of Langford House is proceeding smoothly. Many out-buildings have been converted into laboratories, lecture rooms, and operating theatres. A new block will be the scientific H.Q. for the students.

"It is particularly fortunate that an association has been formed with the Somerset Cattle Breeding Centre and the Ministry of Agriculture, for through their laboratories pass a wealth of material suitable for veterinary research and instruction. The Somerset Cattle Breeding Centre is known to agriculturists for its work on cattle artificial insemination, and University students will receive highly specialised information from the centre's veterinary officers. The Ministry laboratories provide an investigation service, at the request of practitioners, covering Herefordshire, Worcestershire, Wilts and Somerset. Through this service the University students will be kept in touch with the veterinary problems of this area. It is likely that the University will offer surgical facilities for large animals. Some veterinary surgeons in the area may prefer to send such animals to the well-equipped University operating theatres. These will be used for practical instruction. In this way the centre's aim to live as an essential part of the West-country farming community will be further fostered."

CORRESPONDENCE

The views expressed in letters addressed to the Editor represent the personal opinions of the writer only and their publication does not imply endorsement by the B.V.A.

"ALLEGED OVERSTOCKING"

Sir,—As one of the veterinary surgeons appearing in the case referred to by Mr. Glave Saunders in your issue of January 26th, I feel I must comment on his inference that there was "conflicting professional evidence."

All the veterinary surgeons appearing in court were unanimous in stating that overstocking was the cause of intense suffering in a cow.

As I myself never saw the animals involved, and as the defendant's veterinary surgeons only examined them two days after the date of the alleged overstocking, no conflict of opinion on this point was possible.—Yours faithfully, Lucy R. Robinson, The Grey House, Purleigh, Nr. Chelmsford, Essex. *January 29th*, 1952.

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"PINS INSTEAD OF SUTURES"

Sir,—I was interested to read my friend Mr. Hogarth Scott's letter in to-day's issue of *The Veterinary Record*, and would like to make one or two comments on it.

I am a little surprised that Mr. Scott is still using silver sutures when stainless steel suture wire is readily available in sizes which correspond very closely to the usual nylon suture sizes. There is also available a tougher and springier stainless steel wire for orthodontic work.

I feel that, in Mr. Scott's cases as described, the avulsed skin of the lips and chin could have been held back in position by means of a continuous stainless steel suture passing through the skin at the edge of the "gum-lip" junction, and around the neck of the teeth, or even through the alveolus between the tooth roots. By this means the gum-lip junction would have been in close apposition right round the jaw. The stainless steel wire is equally non-irritant to the tissues as are stainless steel pins, and in a case of this kind would leave nothing sticking out with which the animal could interfere. The potentially dangerous infected area between the horizontal rami of the mandibles could be dealt with by means of an indwelling rubber drain, which piece of apparatus is rarely heard of in this antibiotic age, but is still a very valuable addition to the surgeon's armamentarium. Provided these sutures are not pulled too tight, no local tissue necrosis is likely to occur.

In conclusion, I would like to make a plea for the extended use of stainless steel as a suture material, particularly in such techniques as the closure of laparotomy incisions in bovines.—Yours faithfully, N. Robert Turnbull, 65, Worting Road, Basingstoke. *February 2nd*, 1952.

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PROFESSIONAL DISCIPLINE

Sir,—I was most surprised to read in your Supplement issued on January 19th that, in connection with a certain case, the Preliminary Investigation Committee had presumed to put before its superior authority a decision that the alleged transgressor should incur a *reprimand* for his or her alleged professional misconduct!

From where does this Committee get any authority to make such a recommendation to the Disciplinary Committee set up under the Veterinary Surgeons Act of 1948?

Unless this situation is cleared up, at once, the day will not be far distant when a respondent will find himself recommended for *reprimand* by one committee, and only *warned as to future conduct* by another!

Could any such recommendation on the part of any committee, to the committee authorised to deal with such matters, be more prejudicial to a fair and impartial hearing of a charge against a member?—Yours faithfully, Thomas Lishman, 23, Queen's Gate Gardens, S.W.7. *January 20th*, 1952.

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THE VETERINARY SURGEON'S TITLE

Sir,—For some time now, there has been a strong desire by a large section of Ms.R.C.V.S. to adopt the courtesy title of Doctor.

One person objects, because, he states, we have an inferiority complex. If a desire to raise our status above that of the unqualified is considered such, then perhaps he is right. Perhaps the real objection, however, is "What was good enough for Gran'pa is good enough for me."

As I see it, our leaders missed the boat with the passing of the Veterinary Surgeons Act 1948. In spite of opposition from almost the entire profession, they allowed the granting of the title "Veterinary Practitioner" to the unqualified registered person. They could have redeemed themselves by requesting the courtesy title of Doctor for Ms.R.C.V.S.

We hear much of the efforts made to raise (or is it praise?) the status of the veterinary surgeon. Yet, the obvious simple method, *i.e.*, to adopt the title of "Doctor," is ignored or probably never even thought about.

Surely a vote on the matter, whereby *every* M.R.C.V.S. is able to give his or her "Yes" or "No," is the only solution to the problem?

We are now members of the B.V.A. Why not Doctors too?—Yours faithfully, Robert S. Townson, Carlyon Bay, Cornwall. *January 31st*, 1952.

DISEASES OF ANIMALS ACT, 1950—GREAT BRITAIN

Summary of Returns of Confirmed Outbreaks of Scheduled (Notifiable) Diseases

Period	Anthrax	Foot-and-mouth	Fowl Pest	Parasitic Mange*	Sheep Scab	Swine Fever
1st to 15th Jan. 1952	25	11	21	—	—	42
Corresponding period in—						
1951	17	—	131	—	2	35
1950	13	—	10	—	5	—
1949	12	—	15	—	3	1

Tuberculosis Order of 1938

The number of bovine animals slaughtered under the Tuberculosis Order of 1938 during the period October 1st to December 31st, 1951, was 759.